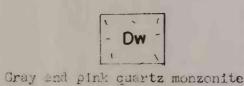


Fresh, fine-grained, light-gray porphyry with 1/16-inch euhedral phenocrysts of quartz and microcline; bictite and fine muscovite also present in very fine grained groundmass of quartz and feldspar. Porphyry intrudes contact-metamorphosed metasiltatione of the Kellyland Formation along the road about 3/4 mile southwest of Chain Island, near the northesstern corner of the area. Size and shape of intrusive unknown, out assumed small and dike-like: Age relation with nearby quartz monzonite unknown but porphyry is assumed to be post-monzonite



Gray and pink porphyritic quartz monzonite

This rock, informally referred to as Bottle Lake quartz monzonite, is gray or pink, coarse-grained, biotitic or hornblendic, porphyritic quartz monzonite. Pluton extends from Waite quadrangle southwestward and westward into Scraggly Lake, Springfield, Winn, Wabassus Lake, Nicatous Lake, and Saponse quadrangles (Rand. 1958; Doyle, and others, 1961; Iarrabee, 1963a-d). Believed of Devonian age. Well-exposed at type locality 1 mile northwest of Bottle Lake, along road from Springfield southerly to that lake, Springfiel! quadrangle, where euhedral microcline thenocrysts up to 1 1/4 inches long and I inch wide have repaktivi texture, and phenocrysts up to 1 inch by 2 inches are comon. Distribution of pink and gray biolitic work random. Age of sample from Bottle Lake locality is about 342 m.y. determined by potassium- room method (Thomas, H., Marvin, R., and Elmore, P., written communication, July 2, 1962), or about 410 million years, determined by lead-alpha method (Sterr, T. S., written communication, March 23, 1962). Age of sample from road from West Musquash Lake to Upper Oxbow Lake, Scragzly Lake quadrangle, about 370 m.y. by potessium-argon method, or 380 m.y. by lead-alpha method (Faul, and others, 1963). Age of sample from along Route 1, Waite quadrangle, is 372 m.y. by potossiumargon method, or 400 m.y. by lead-alpha method (Faul, and others, 1963). In Nicatous Lake quadrangle, wellexposed south of outlet of Lower Chain Lake and at road crossing outlet of Upper Chain Lake, where rock is gray, coarsely porphyritic, and hornblendie. It the latter locality inclusions of fine-grained biotite schist are common, and contain porphyroblasts of microcline and hornblende. Where exposed in the northern part of Nicatous Lake, rock is flesh-colored, hornblendic and biotitic, and coersely porphyritic, with microcline phenocrysts as large as 5/8 by 1 1/2 inches. The apparent southern boundary at Nicatous Lake, bused upon large angular glacial boulders (elsewhere useful in determining boundaries) is shown about 1.4 miles south of that indicated by Bouguer gravity anomaly. If the contact as drawn is correct, the Bouquer anomaly suggests a considerable change in attitude of contact at shallow depth (Kane, Martin, oral communication, July 13, 1963)



This gray and pink, mediam-grained quartz monzonite, informally referred to as Wabassus quartz monzonite, is best exposed on eastern shore of Grand Lake between Grand Lake Stream and Dyer Cove Point -the type areaand in road from Grand Lake Stream village westward to Wabassus Lake, and forms prominent Wabassus Mountain, all in Wabassus Lake quadrangle. Believed of Devonian age. Commonly equigranular, particle size ranges from 1/8 to 3/8 inch; rerely porphyritic, with microcline phenocrysts 1/4 by 1/2 to 1 inch. Gray and leucocratic on Amazon Mountain, Big Lake quadrangle; pink or gray, and biotitic or hormblendic elsewhere. Distinctly different from coarsely porphyritic quartz monzonite in separate pluton in northern part of Nicatous Lake quadrangle. Where exposed in southeastern part of quadrangle, is gray, medium-to coarse-grained, and in places porphyritic. Shearing observed along road and also at Nicatous Lake, as shown in fig. 2

EVONIAN

CARBONIFEROUS

**PENNSYLVANIAN** 

AND

DEVONIAN

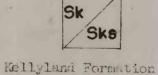
YOUNGER

OR

VONIAN

0

DEVONIAN



Gray, chiefly carbonate-bearing metasiltatone and sandatone, slate, and quartzite

Medium-gray, curbonate-bearing, metasilustone and slightly metamorphosed impure sandstone, quartite, and darkergray slate (20 percent of unit), have been named the Kellyland Formation (Sk) of Silurian(?) age (Larrabee, 1963e). Iron carbonates are abundant in most beds other than quartzite. Some tuffaceous beds occur. Slate layers from 1 to 8 inches thick, locally 1/8 inch to 4 feet. Metasilistone and slightly metamorphosed argillaceous sendstone from 4 inches to 4 feet thick, locally 20 feet. Rarely, thinly laminated light and dark sandstone layers occur in metasiltstone. Thin beds of slightly metamorphosed quartz-granule conglomerate associated with sandatone and quartzite beds in places. Metasiltstone commonly has good graded bedding and erossbedding. Folds small and tight; bedding tops reversed within short distance. Most wells, drilled or dug, yield hard water. Rock sheared at many exposures along Fourth Machias Lake. Hornfels near contact with granitic rocks contains biotite, scattered magnetite, pyrite, and cordierite retrograded to sericite, chlorite, and quartz aggregates that weather out to form pits; these increase in size toward contact, where in places they are size and shape of rice grains. Thickness of formation not escentsined because of lack of outcrops and key bads, and isoclinal folding, but probably several thousand feet. No identifiable fossils unquestionably from this formation have been reported

South of the area on the map shown as Kellyland (Sk) is a lenglike mass (Sks) of light- and dark-gray, thin-bedded chart and metasiltatone, in places carbonate bearing.

Some medium- to dark-gray impure quartite. Silicification irregularly distributed, the degree varying within a hand specimen. Much silicified breceis in places; pyrite commen. Rock unit might be Kellyland Formation silicified along fault zone, or an entirely different unit not heretofore observed in general area



Ordevician or Cambrian metamorphic rocks, undifferentiated
Coloritic quartzite, and green and red slates

Argillaceous and chloritic quartzite, sandy metasiltstone, thin beds of green slate, and rarely thin beds and lenses of red and purplish slate. Rocks of unknown but presumably Ordovician or Cambrian age: remote possibility of Lower Silurian age, as indicated in southeastern corner Danforth quadrangle (larrabee and Spencer, 1963; Griscom and Larrabee, 1963). Quartizite and sondy metabilitatione, commonly in 1/4 to 1/2 inch heds separated by paper-thin luminue of green slate, minutely crumpled by slippage along slate laminec, and minute folds later folded and rock foliated. It is predominantly impure quartaite unit contains green slate beis and lenses from few inches to 2 or 3 feet thick, and occasional lenses of red to purplish clate 1 to 6 inches thick and commonly less than 100 feet long. Rocks wellexposed along Baskshegan Lake in Scraggly Lake qualrangle (Larrebee, 1963b); at Knownothing Cove, a few 1/8-inch hematite rodules replaced by silica occur in red slate. Rerely, thin pinkish queruz and feldspar granule metaconglowerate present to the southeast. Although outcrops lacking over wide areas where needed for determination of structural and stration phic relations, works believed faulted up into younger meta-sedimentary rocks prior to intrusion of Bottle Lake quartz monzonite. Several chloritic argillaceous quartzite outerops on south shore Fourth Machine Lake, Nicatous Lake quadrangle, believed part of this unit. Where exposed along road in northern part of Lead Mountain quadrangle, and believed to extend into southern part of Nicetous Lake quadrungle on basis of glacial float, unit believed represented by finegrained purplish-gray, pyritic, biotitic quartzite, dark-gray non-carbonate-bearing metasiltatone and slate, and dark-jruy quartz-sericite schist

Structure

Regional trend of metasedimentary rocks is northeast; beds tightly folded, generally dip steeply and in places are everturned. Both quartz monzonite plutons trend north-easterly.

Two northeast-trending faults are inferred to have brought

Kellyland Formation into contact with rocks of Ordovician or Cumbrian age prior to intrusion of Bottle Lake quartz monzonite. A more recent, major system of discontinuous faults, later than 11 intrusives of Devonian age, trends generally northeasterly across map into adjacent quadrangles; this trends parallel to and on strike with major Springhill Fault (Smith, J. C., written communication, December 5, 1962) near Fredericton, New Brunswick, and parallel with Fundy and Lubec Faults (Cumming, L. M., 1962) to southeast. Many small quartz, and quartz and calcite veins in shear planes indicate the trend at Fourth Machias Lake. In Kellyland (Larrabee, 1963e), and Waite (Larrabee, 1963a) quadrangles, lenses and blocks of Upper Devonian-Mississippian sedimentary rocks, notably soft, red, calcareous conglomerate and silistone, have been downfaulted into older rocks; and in Nicatous Lake quadrangle much hard, red and light gray quartzite conglomerate and gray quartzite has been downfaulted. This major fault zone has been traced by the writer almost continuously from the St. Croix River southwesterly about 50 miles, and probably continues into Saponac quadrangle. In New Brunswick, it may continue intermittently from the St. Croix River (Clark, 1961) to Springhill, another 50 miles. Although major trend of faults and shear zones is northeasterly, other more northerly and northwesterly-trending zones of movement are strong (fig. 2). The southeastern and southwestern parts of the area have not been studied, and in fact, this entire quadrangle is deserving of a detailed investigation. Further study of the major fault zone would be of considerable academic interest, at least.

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CAMBRIAN OR ORDOVICIAN